

CHAPTER 3

POLICY

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3.1 INTRODUCTION

3.1.1 Purpose

Drainage concerns are one of the most important aspects of highway design and construction. This Chapter will outline specific policies that guide and determine the multitude of variables that influence drainage design.

3.1.2 Policy vs. Criteria

Policy and criteria statements are frequently closely related. Criteria are the Department's numerical or specific guidance that is founded in broad policy statements. For this *Manual*, the following definitions of policy and criteria will be used:

Policy — Policy is a definite course of action or method of action, selected to guide and determine present and future decisions.

Design Criteria — Design criteria are the standards by which a policy is implemented or placed in action. Thus, design criteria are needed for design; policy statements are not. Following is an example of a policy statement:

The designer will size the drainage structure to accommodate a flood compatible with the projected traffic volumes.

The design criteria for designing the structure might be:

For projected traffic volumes less than or equal to 750 vehicles per day, drainage structures shall be designed for a 10-yr flood (exceedence probability of 10%). For projected traffic volumes greater than 750 vehicles per day, a drainage structure shall be designed for a 25-yr flood (exceedence probability of 4%).

3.1.3 Chapter Outline

The following Sections of this Chapter will present information on the hydraulic design of drainage structures and related Federal and UDOT policies. Some Sections will be limited to outlining the relevant policies (with references indicating where details can be obtained), and other Sections will state the policies and give detailed information.

3.2 GENERAL HYDRAULIC DESIGN POLICIES

3.2.1 Introduction

An adequate drainage structure may be defined as one that meets the following policies:

- the design of the structure meets or exceeds UDOT standard engineering practice, and
- the design is consistent with what a reasonably competent and prudent designer would do under similar circumstances.

The studies listed below are normally conducted as a part of the design of highway drainage structures and serve as a means of achieving an adequate drainage design:

- hydrologic and hydraulic analysis, and
- engineering evaluation of selected alternatives.

These studies are discussed further in the following Sections.

3.2.2 Hydrologic Analysis

Present state-of-practice formulas and models for estimating flood flows are based on statistical analyses of rainfall and runoff records. The recommended practice is for the designer to select appropriate hydrologic estimating procedures, and obtain runoff data where available for evaluation, calibration and determination of the predicted value of the desired flood frequencies. The predicted value of the flood flows represents the designer's best estimate with varying degrees of error. The expected magnitude of this variation can be determined for some formulas or models as a part of the hydrologic design procedure.

3.2.3 Hydraulic Analysis

The next step in the design process involves preliminary selections of alternative designs that are judged to meet the site conditions and to accommodate the flood flows selected for analysis. The hydraulic analysis is made utilizing appropriate formulas, physical models or computer programs for defining, calibrating and checking the performance of the preliminary designs over a range of flows.

3.2.4 Engineering Evaluation

The final step in the design process is the engineering evaluation of the preliminary designs and approval of the selected final design. This process involves the consideration and balancing of a number of factors. Some of these factors are:

- legal considerations,
- flood hazards to highway users and neighboring property owners,
- hydraulic efficiencies,
- costs,
- environmental and social concerns, and
- other site-specific concerns.

3.2.5 General Policies

Hydrologic analysis and hydraulic analysis set forth the design process representative of the Department's present "standard engineering practice." Engineering evaluation outlines the approach to be followed by a "reasonably competent and prudent designer" in evaluating, selecting and approving a final design. The following policies are made for this design process:

- It is the designer's responsibility to provide an adequate drainage structure. The designer is not required to provide a structure that will handle all conceivable flood flows under all possible site conditions.

- The detail of design studies should be commensurate with the risk associated with the encroachment and with other economic, engineering, social or environmental concerns.
- The overtopping and/or design flood may serve as criteria for evaluating the adequacy of a proposed design. The “overtopping flood” is the smallest recurrence interval flood that will result in flow over the highway or other watershed boundary. The overtopping flood flow is the flow that overtops the highway or other watershed boundary limit. The “design flood” is the recurrence interval of the flood for which the drainage structure is sized to assure that no traffic interruption or significant damage will result. The overtopping flood and the design flood may vary widely depending on the grade, alignment and classification of the road and the characteristics of the water course and floodplain.
- The predicted value of the 100-yr or base flood serves as the present engineering standard for evaluating flood hazards and as the basis for regulating floodplains under the National Flood Insurance Program. The designer must make a professional judgment on the degree of risk that is tolerable for the base flood on a case-by-case basis.
- The developed hydraulic performance curve of a drainage structure depicts the relationship between floodwater stage (or elevation) and flood-flow magnitudes and frequencies. The performance curve should include the 100-yr flood. With the performance curve, the designer can evaluate the adequacy of the design for a range of flows and consider errors of estimate in the hydrologic estimating procedure. It is standard engineering practice to use the predicted value of the 100-yr flood as the basis for evaluating flood hazards; however, flows larger than this value may be considered for complex, high-risk or unusual cases that require special studies or risk analyses.

3.3 FEDERAL POLICIES

3.3.1 Introduction

The following Section lists the Federal legislation that contains the Federal policies that might affect drainage design and construction. This Section gives the legislative reference, regulations reference, purpose, applicability, general procedures and agency for coordination and consultation. For more detailed information on specific Federal policies, the applicable legislation should be consulted. Note: Abbreviations are given at the end of this Section.

3.3.2 Environmental

1. NATIONAL ENVIRONMENTAL POLICY ACT: 42 USC 4321-4335 (P.L. 91-190 and 94-83). Reference: 23 CFR 771-772, 40 CFR 1500-1508, Executive Order 11514 as amended by Executive Order 11991 on NEPA responsibilities.

Purpose — Consider environmental factors through systematic, interdisciplinary approach before committing to a course of action.

Applicability — All FHWA actions.

General Procedures — Procedures set forth in CEQ regulations and 23 CFR 771.

Coordination — Appropriate Federal, State and local agencies.

2. SECTION 4(F) OF THE DEPARTMENT OF TRANSPORTATION ACT: 23 USC 138, 49 USC 303 (P.L. 100-17, 97-449 and 86-670), 23 CFR 771.135.

Purpose — Preserve publicly owned public parklands, waterfowl and wildlife refuges, and significant historic sites.

Applicability — Significant publicly owned public parklands, recreational areas, wildlife and waterfowl refuges, and all significant historic sites used for a highway project.

General Procedures — Specific finding required: (1) selected alternative must avoid protected areas, unless not feasible nor prudent; and (2) includes all possible planning to minimize harm.

Coordination — DOI, DOA, HUD, State or local agencies having jurisdiction, and State Historic Preservation Officer (for historic sites).

3. ECONOMIC, SOCIAL AND ENVIRONMENTAL EFFECTS: 23 USC 109(h) (P.L. 91- 605), 23 USC 128, 23 CFR 771-772.

Purpose — To assure that possible adverse, economic, social and environmental effects of proposed highway projects and project locations are fully considered and that final decisions on highway projects are made in the best overall public interest.

Applicability — To the planning and development of proposed projects on any Federal-aid system for which the FHWA approves the plans, specifications and estimates or has the responsibility for approving a program.

General Procedures — Identification of social, economic and environmental effects; consideration of alternative courses of action; involvement of other agencies and the public; and systematic interdisciplinary approach. The report required by Section 128 on the consideration given to the social, economic and environmental impacts of the project may be of the NEPA compliance document.

Coordination — Appropriate Federal, State and local agencies.

4. UNIFORM RELOCATION ASSISTANCE AND REAL PROPERTY ACQUISITION ACT OF 1970: (42 USC 4601 et seq., P.L. 91-646) as Amended by the Uniform Relocation Act Amendments of 1987 (P.L. 100-17), 49 CFR 24.

Purpose — To implement the Uniform Act as amended in an efficient manner; to ensure that property owners of real property acquired for persons displaced by Federal-aid projects are treated fairly, consistently and equitably; and to ensure that they will not suffer disproportionate injuries.

Applicability — All projects involving Federal-aid funds.

General Procedures — Procedures set forth in 49 CFR 24.

Coordination — DOT/FHWA has lead responsibility. Appropriate Federal, State and local agencies.

5. TITLE VI OF THE CIVIL RIGHTS ACT OF 1964: (42 USC 2000d et seq.) 23 USC 324; Americans with Disabilities Act (42 USC 12101) and Related Statutes: 49 CFR 21 AND 23 CFR 200.

Purpose — To ensure that no person shall, on the grounds of race, color, national origin, age, sex or disability, be subjected to discrimination under any program or activity receiving Federal financial assistance.

Applicability — All Federal programs and projects.

General Procedures — Procedures set forth in 49 CFR 21 and 23 CFR 200.

Coordination — FHWA headquarters and field offices.

6. EXECUTIVE ORDER 12898: ENVIRONMENTAL JUSTICE: 59 CFR 7629, 62 CFR 18377, 60 CFR 33896.

Purpose — Avoid Federal actions that cause disproportionately high and adverse impacts on minority and low-income populations with respect to human health and the environment.

Applicability — All Federal programs and projects.

General Procedures — Procedures set forth in DOT Final Environmental Justice Strategy and DOT Order dated April 15, 1997.

Coordination — FHWA headquarters and field offices.

7. PUBLIC HEARINGS: 23 USC 128, 23 CFR 771.111(h).

Purpose — To ensure adequate opportunity for public hearing(s) on the effects of alternative project locations and major design features, and the consistency of the project with local planning goals and objectives.

Applicability — Public hearings or hearing opportunities are required for projects described in each State's FHWA-approved public involvement procedures.

General Procedures — Public hearings or opportunities for public hearings during the consideration of highway location and design proposals are conducted as described in the State's FHWA-approved public involvement procedures. States must certify to FHWA that such hearings or the opportunity, therefore, have been held and must submit a hearing transcript to FHWA.

Coordination — Appropriate Federal, State and local agencies.

8. SURFACE TRANSPORTATION AND UNIFORM RELOCATION ASSISTANCE ACT OF 1987: Section 123(f) Historic Bridges 23 USC 144(O) (P.L. 100-17).

Purpose — Complete an inventory of on-and-off system bridges to determine their historic significance. Encourage the rehabilitation, reuse and preservation of historic bridges.

Applicability — Any bridge that is listed on, or eligible for listing on, the National Register of Historic Places.

General Procedures — (1) Identify historic bridges on and off system, (2) seek to preserve or reduce impact to historic bridges, (3) seek to donate bridge to public or a responsible private entity prior to demolition.

Coordination — State Historic Preservation Officer and Advisory Council on Historic Preservation.

9. WILDFLOWERS: 23 USC 319(b) (P.L. 100-17), 23 CFR 752.

Purpose — To encourage the use of native wildflowers in highway landscaping.

Applicability — Wildflowers are to be planted on any landscaping project undertaken on the Federal-aid highway system.

General Procedures — At least ¼ of 1% of funds expended on a landscaping project must be used to plant wildflowers on that project.

Coordination — Appropriate Federal and State agencies.

10. HIGHWAY BEAUTIFICATION ACT OF 1965: 23 USC 131, 23 USC 136, 23 USC 319 (P.L. 89-285), 23 CFR 750, 23 CFR 751, 23 CFR 752.

Purpose — To provide effective control of outdoor advertising and junkyards, to protect the public investment, to promote the safety and recreational value of public travel and preserve natural beauty, and to provide landscapes and roadside development reasonably necessary to accommodate the traveling public.

Applicability — Interstate and primary systems (as primary system existed on June 1, 1991) and NHS.

General Procedure — Procedures set forth in 23 CFR 750, 751, 752.

Coordination — DOT/FHWA, State and local agencies.

3.3.3 **Health**

1. SAFE DRINKING WATER ACT: 42 USC 300F - 300J-6 (P.L. 93-523 and 99-339), 23 CFR 650, Subpart E, 40 CFR 141,149.

Purpose — Ensure public health and welfare through safe drinking water.

Applicability — (1) All public drinking water systems and reservoirs (including rest area facilities), (2) actions that may have a significant impact on an aquifer or wellhead protection area that is the sole or principal drinking water source.

General Procedures — (1) Compliance with national primary drinking water regulations, (2) compliance with State wellhead protection plans, (3) compliance with MOAs between USEPA and FHWA covering specific sole-source aquifers.

Coordination — USEPA and appropriate State agency.

2. SOLID WASTE DISPOSAL ACT, as amended by the Resource Conservation and Recovery Act of 1976: 42 USC 6901, et seq., see especially 42 USC 6961-6964 (P.L. 89-272, 91-512 and 94-580), 40 CFR 256-300.

Purpose — Provide for the recovery, recycling and environmentally safe disposal of solid wastes.

Applicability — All projects that necessitate the disposal of solid wastes.

General Procedures — Solid wastes will be disposed of according to the rules for specific waste involved.

Coordination — USEPA.

3. FEDERAL INSECTICIDE, FUNGICIDE AND RODENTICIDE ACT (FIFRA): 7 USC 136-136y (P.L. 92-516), 40 CFR 152-171.

Purpose — Control the application of pesticides to provide greater protection to man and the environment.

Applicability — All activities that necessitate the use of restricted pesticides.

General Procedures — Using or supervising “restricted-use” pesticides will require certification; NPDES permit required if sprayed into waters of United States.

Coordination — USEPA and appropriate State agency.

3.3.4 Historic and Archeological Preservation

1. SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT, AS AMENDED: 16 USC 470F (P.L. 89-665, 91-243, 93-54, 94-422, 94-458, 96-199, 96-244 96-515, and 102-575), Executive Order 11593, 23 CFR 771, 36 CFR 60, 36 CFR 63, 36 CFR 800.

Purpose — Protect, rehabilitate, restore and reuse districts, sites, buildings, structures and objects significant in American architecture, archeology, engineering and culture.

Applicability — All properties on or eligible for inclusion on the National Register of Historic Places.

General Procedures — (1) Identify and determine the effects of project on subject properties, (2) afford Advisory Council and affected public an early opportunity to comment in accordance with 36 CFR 800, (3) avoid or mitigate damages to greatest extent possible.

Coordination — State Historic Preservation Officer, Advisory Council on Historic Preservation, DOI (NPS), public.

2. SECTION 110 OF THE NATIONAL HISTORIC PRESERVATION ACT, as Amended: 16 USC 470H-2 (P.L. 96-515), 36 CFR 65, 36 CFR 78.

Purpose — Protect national historic landmarks and record historic properties prior to demolition.

Applicability — All properties designated as National Historic Landmarks. All properties on or eligible for inclusion on the National Register of Historic Places, especially National Historic Landmarks.

General Procedures — (1) Identify and determine the effects of a project on subject properties, (2) afford Advisory Council an early opportunity to comment in accordance with 36 CFR 800.

Coordination — State Historic Preservation Officer, Advisory Council on Historic Preservation, DOI (NPS).

3. ARCHEOLOGICAL AND HISTORIC PRESERVATION ACT: 16 USC 469-469C (P.L. 93-291) (Moss-Bennett Act), 36 CFR 66 (Draft).

Purpose — Preserve significant historical and archeological data from loss or destruction.

Applicability — Any archeological resources discovered as a result of a Federal construction project or Federally licensed activity or program.

General Procedures — (1) Notify DOI (NPS) when a Federal project may result in the loss or destruction of a historic or archeological property, (2) DOI and/or the Federal agency may undertake survey or data recovery.

Coordination — DOI (NPS) departmental consulting archeologist and State Historic Preservation Officer.

4. ACT FOR THE PRESERVATION OF AMERICAN ANTIQUITIES: 16 USC 431-433 (P.L. 59-209), 36 CFR 251.50-.64, 43 CFR 3. ARCHEOLOGICAL RESOURCES PROTECTION ACT: 16 USC 470AA-11 (P.L. 96-95), 18 CFR 1312, 32 CFR 229, 36 CFR 296, 43 CFR 7, 36 CFR 79.

Purpose — Preserve and protect paleontological resources, historic monuments, memorials and antiquities from loss or destruction.

Applicability — Archeological resources on Federally or Indian-owned property.

General Procedures — (1) Ensure contractor obtains permit and identifies and evaluates resource, (2) mitigate or avoid resource in consultation with appropriate officials in the State, (3) if necessary, apply for permission to examine, remove or excavate such objects.

Coordination — Department or agency having jurisdiction over land on which resources may be situated (BIA, BLM, DOA, DOD, NPS, TVA, USFS), State Historic Preservation Officer, recognized Indian tribe, if appropriate.

5. AMERICAN INDIAN RELIGIOUS FREEDOM ACT: 42 USC 1996 (P.L. 95-341), Executive Order No. 13007.

Purpose — Protect places of religious importance to American Indians, Eskimos and Native Hawaiians.

Applicability — All projects that affect places of religious importance to Native Americans.

General Procedures — Consult with knowledgeable sources to identify and determine any effects on places of religious importance. Comply with Section 106 procedures if the property is historic.

Coordination — BIA, State Historic Preservation Officer, State Indian liaison, Advisory Council on Historic Preservation, if appropriate.

6. NATIVE AMERICAN GRAVE PROTECTION AND REPATRIATION ACT: (P.L. 101-601) 25 USC 3001 et seq., 43 CFR 10.

Purpose — Protect human remains and cultural material of Native American and Hawaiian groups.

Applicability — Federal lands and Tribal lands.

General Procedures — Consult with Native American group.

Coordination — DOI (NPS), BIA, State Historic Preservation Officer.

3.3.5 Land and Water Usage

1. WILDERNESS ACT: 16 USC 1131-1136, 36 CFR 293, 43 CFR 19, 8560, 50 CFR 35.

Purpose — Preserve and protect wilderness areas in their natural condition for use and enjoyment by present and future generations.

Applicability — All lands designated as part of the wilderness system by Congress.

General Procedures — Apply for modification or adjustment of wilderness boundary by either Secretary of the Interior or Agriculture, as appropriate.

Coordination — Agriculture (USFS), DOI (USFWS, NPS, BLM) and State agencies.

2. WILD AND SCENIC RIVERS ACT: 16 USC 1271-1287, 36 CFR 297.

Purpose — Preserve and protect wild and scenic rivers and immediate environments for benefit of present and future generations.

Applicability — All projects that affect designated and potential wild, scenic and recreational rivers, and/or immediate environments.

General Procedures — Submit project plans and reports to appropriate Federal agency.

Coordination — DOI (NPS) and/or Agriculture (USFS), State agencies.

3. LAND AND WATER CONSERVATION FUND ACT (SECTION 6(F)): 16 USC 460-4 to -11 (P.L. 88-578).

Purpose — Preserve, develop and assure the quality and quantity of outdoor recreation resources for present and future generations.

Applicability — All projects that impact recreational lands purchased or improved with land and water conservation funds.

General Procedures — The Secretary of the Interior must approve any conversion of property acquired or developed with assistance under this Act to other than public, outdoor recreational use.

Coordination — DOI, State agencies.

4. EXECUTIVE ORDER 11990, PROTECTION OF WETLANDS: DOT Order 5660.1A, 23 CFR 777.

Purpose — To avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative.

Applicability — Federally undertaken, financed or assisted construction, and improvements in or with significant impacts on wetlands.

General Procedures — Evaluate and mitigate impacts on wetlands. Specific finding required in final environmental document.

Coordination — DOI (USFWS), USEPA, USACE, NMFS, NRCS, State agencies.

5. INTERMODAL SURFACE TRANSPORTATION EFFICIENCY ACT OF 1991, Wetlands Mitigation Banks: SEC. 1006-1007 (P.L. 102-240, 105 STAT 1914), 23 USC 103(i) (13), 23 USC 133(b) (11), 23 CFR 771, 777.

Purpose — To mitigate wetlands impacts directly associated with projects funded through NHS and STP, by participating in wetland mitigation banks, restoration, enhancement and creation of wetlands authorized under the Water Resources Dev. Act, and through contributions to Statewide and regional efforts.

Applicability — Federally undertaken, financed, or assisted construction and improvements, or with impacts on wetlands.

General Procedures — Evaluate and mitigate impacts on wetlands. Specific finding required in final environmental document.

Coordination — DOI (USFWS), USEPA, USACE, NMFS, NRCS, State agencies.

6. EMERGENCY WETLANDS RESOURCES ACT OF 1986: 16 USC 3921, 3931 (P.L. 99-645).

Purpose — To promote the conservation of wetlands in the US to maintain the public benefits they provide.

Applicability — All projects that may impact wetlands.

General Procedures — (1) Preparation of a National Wetlands Priority Conservation Plan that provides priority with respect to Federal and State acquisition, (2) provides direction for the National Wetlands Inventory Project.

Coordination — USFWS.

7. NATIONAL TRAILS SYSTEMS ACT: 16 USC 1241-1249, 36 CFR 251, 43 CFR 8350.

Purpose — Provide for outdoor recreational needs and encourage outdoor recreation.

Applicability — Projects affecting national recreational, historic, scenic or side trails designated by Congress and lands through which such trails pass.

General Procedures — (1) Apply for right-of-way easement from the Secretary of Interior or Agriculture, as appropriate, (2) ensure that potential trail properties are made available for use as recreational and scenic trails.

Coordination — DOI (NPS) or Agriculture (USFS).

8. NATIONAL RECREATIONAL TRAILS FUND ACT OF THE INTERMODAL SURFACE TRANSPORTATION EFFICIENCY ACT OF 1991: 16 USC 1261 (P.L. 102-240).

Purpose — To establish a program to allocate funds to the States to provide and maintain recreational trail and trail-related projects.

Applicability — Trails and trail-related projects that are identified in, or which further a specific goal of, a trail plan included or referenced in a Statewide comprehensive outdoor recreation plan, as required by the Land and Water Conservation Fund Act.

General Procedures — Project sponsor applies to the State, and FHWA approves spending for project. The State may be a project sponsor. Assured access to funds is given for motorized, non-motorized, and discretionary recreation uses. States shall give preference to projects with diversified uses.

Coordination — FHWA.

9. RIVERS AND HARBORS ACT OF 1899: 33 USC 401, et seq., as amended and supplemented, 23 CFR Part 650, Subparts D and H, 33 CFR 114-115.

Purpose — Protection of navigable waters in the US.

Applicability — Any construction affecting navigable waters and any obstruction, excavation or filling.

General Procedures — Must obtain approval of plans for construction, dumping and dredging permits (Section 10) and bridge permits (Section 9).

Coordination — USACE, USCG, USEPA, State agencies.

10. FEDERAL WATER POLLUTION CONTROL ACT (1972), as amended by the Clean Water Act (1977 & 1987): 33 USC 1251-1376 (P.L. 92-500, 95-217, 100-4), DOT Order 5660.1A,

23 CFR 650, Subpart B, 771, 33 CFR 209, 320-323, 325, 328, 329, 40 CFR 121-125, 129-131, 133, 135-136, 230-231.

Purpose — To restore and maintain chemical, physical and biological integrity of the Nation's waters through prevention, reduction and elimination of pollution.

Applicability — Any discharge of a pollutant into waters of the US.

General Procedures — 1) Obtain permit for dredge or fill material from USACE or State agency, as appropriate (Section 404), (2) NPDES permit and other discharge permits are to be acquired from USEPA or appropriate State agency (Section 402), (3) water quality certification is required from State water resource agency (Section 401), (4) all projects shall be consistent with the State non-point source pollution management program (Section 319).

Coordination — USACE, USEPA, designated State water quality control agency, designated State non-point source pollution agency.

11. EXECUTIVE ORDER 11988, FLOODPLAIN MANAGEMENT, as amended by Executive Order 12148: DOT Order 5650.2, 23 CFR 650, Subpart A, 23 CFR 771.

Purpose — To avoid the long- and short-term adverse impacts associated with the occupancy and modification of floodplains, and to restore and preserve the natural and beneficial values served by floodplains.

Applicability — All construction of Federal or Federally aided buildings, structures, roads or facilities that encroach upon or affect the base floodplain.

General Procedures — (1) Assessment of flood hazards, (2) specific finding required in final environmental document.

Coordination — FEMA, State and local agencies.

12. NATIONAL FLOOD INSURANCE ACT: (P.L. 90-448), FLOOD DISASTER PROTECTION ACT: (P.L. 93-234) 42 USC 4001-4128, DOT Order 5650.2, 23 CFR 650, Subpart A, 44 CFR 59, 62, 64-68, 70-71, 75-77, 23 CFR 771.

Purpose — (1) Identify flood-prone areas and provide insurance, (2) requires purchase of insurance for buildings in special flood-hazard areas.

Applicability — Any Federally assisted acquisition of construction project in area identified as having special flood hazards.

General Procedures — Avoid construction in, or design to be consistent with, FEMA-identified flood-hazard areas.

Coordination — FEMA, State and local agencies.

13. MARINE PROTECTION RESEARCH AND SANCTUARIES ACT OF 1972, as Amended: 33 USC 1401-1445 (P.L. 92-532, 93-254, 96-572), 33 CFR 320, 330, 40 CFR 220-225, 227-228, 230-231.

Purpose — Regulate dumping of materials into US ocean waters.

Applicability — Any transportation to and dumping into the open sea.

General Procedures — Apply for permit in accordance with existing procedures.

Coordination — USEPA, USACE (if dredge material).

14. WATER BANK ACT: 16 USC 1301-1311 (P.L. 91-559, 96-182), 7 CFR 752.

Purpose — Preserve, restore and improve wetlands of the Nation.

Applicability — Any agreements with landowners and operators in important migratory waterfowl nesting and breeding areas.

General Procedures — Apply procedures established for implementing Executive Order 11990.

Coordination — Secretary of Agriculture, Secretary of Interior.

15. COASTAL ZONE MANAGEMENT ACT OF 1972: 16 USC 1451 et seq. 89-454 (P.L. 92-583, 94-310, 96-464, 101-508, 104-150), 15 CFR 923, 926, 930, 23 CFR 771.

Purpose — Preserve, protect, develop and (where possible) restore and enhance resources of the coastal zone.

Applicability — All projects significantly affecting areas under the control of the State coastal zone management agency for which a plan is approved by the Department of Commerce.

General Procedures — Ensure that projects comply with Federal consistency regulations and the appropriate approved State plan for coastal zone management programs.

Coordination — State coastal zone management agency and the Department of Commerce (OCRM) (NOAA) and USEPA.

16. COASTAL ZONE MANAGEMENT ACT, Reauthorization Amendments of 1990: 6217(g), 23 CFR 650.211.

Purpose — Manage non-point source pollution of activities located in coastal zones.

Applicability — All developmental activities located in coastal zone areas will be subject to non-point source control measures developed by the State Coastal Zone Agency.

General Procedures — Ensure projects comply with State OCZM Plans for controlling non-point sources.

Coordination — State OCZM Agency, OCRM (NOAA), USEPA.

17. COASTAL BARRIER RESOURCE ACT, as Amended: 16 USC 3501-3510, 42 USC 4028 (P.L. 97-348), GREAT LAKES COASTAL BARRIER ACT OF 1988: (P.L. 100-707), 13 CFR 116 Subparts D, E, 44 CFR 71, 205 Subpart N.

Purpose — Minimize the loss of human life, wasteful expenditures of Federal revenues and the damage to fish, wildlife and other natural resources.

Applicability — Any project that may occur within the boundaries of a designated coastal barrier unit. Exemptions for certain actions are possible.

General Procedures — Coordinate early with the USFWS Regional Director. Consult maps that depict the boundaries of each coastal barrier resources system unit.

Coordination — FEMA, DOI (USFWS).

18. FARMLAND PROTECTION POLICY ACT OF 1981: 7 USC 4201-4209 (P.L. 97-98, 99-198), 7 CFR 658.

Purpose — Minimize impacts on farmland and maximize compatibility with State and local farmland programs and policies.

Applicability — All projects that take right-of-way in farmland.

General Procedures — (1) Early coordination with NRCS, (2) land evaluation and site assessment, (3) determination on whether or not to proceed with farmland conversion, based on severity of impacts and other environmental considerations.

Coordination — NRCS.

19. RESOURCE CONSERVATION AND RECOVERY ACT OF 1976 (RCRA), as Amended: 42 USC 690, et seq. (P.L. 94-580, 98-616), 40 CFR 260-271.

Purpose — Protect human health and the environment, prohibit open dumping, manage solid wastes, regulate treatment, storage, transportation and disposal of hazardous waste.

Applicability — Any project that takes right-of-way containing a hazardous waste.

General Procedures — Coordinate with USEPA or State agency on remedial action.

Coordination — USEPA or State agency approved by USEPA, if any.

20. COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980 (CERCLA), as Amended: 42 USC 9601-9657 (P.L. 96-510). Superfund Amendments and Reauthorization Act of 1986 (SARA): (P.L. 99-499), 40 CFR 300, 43 CFR 11.

Purpose — Provide for liability, compensation, cleanup and emergency response for hazardous substances released into the environment and the cleanup of inactive hazardous waste disposal sites.

Applicability — Any project that might take right-of-way containing a hazardous substance.

General Procedures — (1) Avoid hazardous waste sites, if possible, (2) check USEPA lists of hazardous waste sites, (3) field surveys and reviews of past and present land use, (4) contact appropriate officials if uncertainty exists, (5) if hazardous waste is present or

suspected, coordinate with appropriate officials, (6) if hazardous waste encountered during construction, stop project and develop remedial action.

Coordination — USEPA or State agency approved by USEPA, if any.

21. ENDANGERED SPECIES ACT OF 1973, as Amended: 16 USC 1531-1543 (P.L. 93-205, 94-359, 95-632, 96-159, 97-304), 7 CFR 355, 50 CFR 17, 23, 81, 222, 225-227, 402, 424, 450-453.

Purpose — Conserve species of fish, wildlife and plants facing extinction.

Applicability — Any action that is likely to jeopardize continued existence of such endangered/ threatened species or result in destruction or modification of critical habitat.

General Procedures — Consult with the Secretary of the Interior or Commerce, as appropriate.

Coordination — DOI (USFWS), Commerce (NMFS).

22. FISH AND WILDLIFE COORDINATION ACT: 16 USC 661-666C (P.L. 85-624, 89-72, 95-616).

Purpose — Conservation, maintenance and management of wildlife resources.

Applicability — (1) Any project that involves impoundment (surface area of 4.05 hectares or more), diversion, channel deepening or other modification of a stream or other body of water, (2) transfer of property by Federal agencies to State agencies for wildlife conservation purpose.

General Procedures — Coordinate early in project development with USFWS and State fish and wildlife agency.

Coordination — DOI (USFWS), State fish and wildlife agencies.

23. MIGRATORY BIRD TREATY ACT: 16 USC 706c-760g.

Purpose — To protect most common wild birds found in the United States.

Applicability — Makes it unlawful for anyone to kill, capture, collect, possess, buy, sell, trade, ship, import or export any migratory bird. Indirect killing of birds by destroying their nests and eggs is covered by the Act; therefore, construction in nesting areas can constitute a taking.

General Procedures — The USFWS will review and comment on the effects of a proposal that could kill birds, even indirectly.

Coordination — DOI (USFWS), State Fish and Wildlife Agencies.

24. INTERMODAL SURFACE TRANSPORTATION EFFICIENCY ACT OF 1991, Transportation Enhancement Activities: Sec. 1007 (P.L. 102-240), 23 USC 101(g), 133(b)(e).

Purpose — To provide funds for Transportation Enhancement activities, such as landscaping and beautification, rehabilitation and operation of historic transportation facilities.

Applicability — Funds are to be used in all areas except roads classified as local or rural minor collectors, unless such roads are on a Federal-aid highway system.

General Procedures — 10% of STP funds annually apportioned to each State are for Transportation Enhancement activities.

Coordination — FHWA.

25. INTERMODAL SURFACE TRANSPORTATION EFFICIENCY ACT OF 1991, Sec. 1038
Recycled Paving Material: (P.L. 102-240).

Purpose — To reduce the use of virgin materials used for paving our nation's highways.

Applicability — Each State shall certify that it has satisfied the minimum utilization requirement for asphalt pavement containing recycled rubber.

General Procedures — 20% of asphalt funded with Federal-aid in each State is required to include recycled rubber by 1997.

Coordination — FHWA.

26. INTERMODAL SURFACE TRANSPORTATION EFFICIENCY ACT OF 1991, Sec. 1047
Scenic Byways Program: (P.L. 102-240).

Purpose — To identify and develop those special scenic byways that offer outstanding scenic, historic, natural, cultural, recreational or archaeological values.

Applicability — Any public road or highway that meets the criteria for inclusion as a Scenic Byway or an All-American Road.

General Procedures — Nominations may originate from any local government, private group or individual, but must come through the States. Final designations are made by the Secretary of Transportation.

Coordination — FHWA.

3.3.6 **Noise**

STANDARDS: 23 USC 109(i) (P.L. 91-605) (P.L. 93-87), 23 CFR 772.

Purpose — Promulgate noise standards for highway traffic.

Applicability — All Federally funded projects for the construction of a highway on new location, or the physical alteration of an existing highway, which significantly changes either the vertical or horizontal alignment or increases the number of through traffic lanes.

General Procedures — (1) Noise impact analysis, (2) analysis of mitigation measures, (3) incorporate reasonable and feasible noise abatement measures or reduce or eliminate noise impact.

Coordination — FHWA.

3.3.7 Air Quality

1. CLEAN AIR ACT (as Amended), TRANSPORTATION CONFORMITY RULE: 23 USC 109(j), 42 USC 7521(a), (P.L. 101-549), 23 CFR 771, 40 CFR 51, 93.

Purpose — To ensure that transportation plans, programs and projects conform to the State's air quality implementation plans.

Applicability — Non-attainment and maintenance areas.

General Procedures — Transportation plans, programs and projects must conform with State Implementation Plans (SIPs) that provide for attainment of the national ambient air quality standards.

Coordination — FTA, USEPA, MPOs, State Departments of Transportation and State and local Air Quality Control Agencies.

2. CLEAN AIR ACT (as Amended), Sanctions: 42 USC 7509, Sec. 179(b), Sec. 110(m) (P.L. 101-549), 40 CFR 52.

Purpose — To restrict Federal funding and approvals for highway projects in States that fail to submit or implement an adequate State Implementation Plan (SIP).

Applicability — In non-attainment areas 24 months after USEPA has identified a SIP deficiency. May be applied Statewide under separate rulemaking.

General Procedures — (1) After USEPA finds that a State failed to submit or implement a SIP, that the SIP is incomplete, or disapproves a SIP, an 18-month time clock begins, (2) unless deficiencies are corrected within 18 months, 2:1 offset sanctions are applied. Six months later, highway sanctions are applied.

Coordination — FTA, USEPA, MPOs, State Departments of Transportation and State and local Air Quality Control Agencies.

3. INTERMODAL SURFACE TRANSPORTATION EFFICIENCY ACT OF 1991, Congestion Mitigation and Air Quality Improvement Program (CMAQ): Sec. 1008 23 USC 149.

Purpose — To assist non-attainment and maintenance areas to reduce transportation-related emissions.

Applicability — Transportation programs or projects in non-attainment areas and areas redesignated to maintenance that are likely to contribute to the attainment or maintenance of the NAAQS.

General Procedures — (1) Project sponsor (transit operator, municipal office, etc.) develops formal proposal to improve air quality, (2) submit to the MPO, State for evaluation, and approval, (3) included in the TIP and approved as eligible by FTA and FHWA in consultation with USEPA.

Coordination — FTA, USEPA, MPOs, State Departments of Transportation and State and local Air Quality Control Agencies.

3.3.8 Abbreviations

Following are the abbreviations used in the above descriptions of Federal policies:

BIA	— Bureau of Indian Affairs
BLM	— Bureau of Land Management
CEQ	— Council on Environmental Quality
CERCLA	— Comprehensive Environmental Response, Compensation and Liability Act
CFR	— Code of Federal Regulations
CZM	— Coastal Zone Management
DOA	— Department of the Army
DOD	— Department of Defense
DOI	— Department of the Interior
DOT	— Department of Transportation
FEMA	— Federal Emergency Management Agency
FHWA	— Federal Highway Administration
FIFRA	— Federal Insecticide, Fungicide, and Rodenticide Act
FTA	— Federal Transit Authority
FWPCA	— Federal Water Pollution Control Act
HUD	— Housing and Urban Development
ISTEA	— Intermodal Surface Transportation Efficiency Act of 1991
MPO	— Metropolitan Planning Organization
NMFS	— National Marine Fisheries Service
NPDES	— National Pollutant Discharge Elimination System
NPS	— National Park Service
NRCS	— National Resource Conservation Service
OCRM	— Ocean and Coastal Resource Management
P.L.	— Public Law
RCRA	— Resource Conservation and Recovery Act
SARA	— Superfund Amendments and Reauthorization Act
SEE	— Social, Economic, and Environmental
SIP	— State Implementation Plan
Stat.	— Statute
STP	— Surface Transportation Program
TEA-21	— Transportation Equity Act for the 21 st Century
TVA	— Tennessee Valley Authority
USACE	— US Army Corps of Engineers
USC	— United States Code
USCG	— US Coast Guard
USEPA	— US Environmental Protection Agency

USFS — US Forest Service
USFWS — US Fish and Wildlife Service

3.4 UDOT POLICIES

UDOT has organized its Policies and Procedures for the government of the Department of Transportation and for all the improvement projects.

The following list is a condensed version of UDOT policies that may affect the design and construction of drainage improvements:

I. General

UDOT 02-10 – Fiscal Accounting System

Purpose — To select and authorize the use of a Fiscal Accounting System

Applicability — All preconstruction and construction activities involving accounting

General Procedures — Managers use FI-NET for project accounting and EPM for project management.

Coordination — Utah State Division of Finances.

UDOT 04-1 – Community Relations

Purpose — To keep all interested persons advised of plans and programs of the Department of Transportation.

Applicability — All improvement projects.

General Procedures — Give out information to interested parties on projects affecting them

Coordination — UDOT Public Relations Department, Administration Department.

UDOT 05B-5 – Government Records And Management Act, Process For Releasing UDOT Records

Purpose — To establish a process for releasing UDOT Records.

Applicability — All UDOT records.

General Procedures — No documents, records, data or reports shall be released by any employee except as provided in the “Department’s Document Classification Reports” of and/or provided by GRAMA.

Coordination — Department’s Risk Management Section.

UDOT 05C-40a – Equal Employment Opportunity.

Purpose — To inform employee and customers of the Department that UDOT is an Equal Opportunity Employer and believes in Equal Opportunity in all UDOT programs, activities, and services.

Applicability — All UDOT programs, activities and services.

General Procedures — The Department or any of its employees shall not subject a person to discrimination on the grounds of race, color, religion, national origin, sex, age or disability.

Coordination — Administration office, Human Resource Division.

UDOT 05D-2 – Personal Protective Equipment and Safety Clothing

Purpose — To define employees responsibility to meet OSHA and UDOT Risk Mannagement Regulations and guidelines regarding the use of personal protective equipment and safety clothing.

Applicability — All UDOT employees

General Procedures — Employees shall wear the appropriate protective equipment and safety clothing to perform their prescribed work.

Coordination — UDOT Risk Management Section

UDOT 06A-43 – Widening Pavements to Curb and Gutter

Purpose — Allows the use of Department resources for widening the pavement of State Highway from the edge to existing pavement to the edge of new curb and gutter installed by others.

Applicability — For a minimum of 500 ft of pavement or more

General Procedures — New curb and gutter installed by others. The new curb must maintain continuity of drainage with existing drainage facilities.

Coordination — UDOT District Director/District Engineer

UDOT 07-10 – Programming Highway Construction Projects

Purpose — To establish the authority for the development of the Statewide Transportation Improvement Program (STIP), and outline the procedures involved in the process.

Applicability — All state highway improvement projects

General Procedures — The Transportation Commission is the approving authority for all construction programs and projects. UDOT will prepare and annually update the program for the construction projects to be considered and approved by the transportation commission.

Coordination — Transportation Commission, UDOT Director

UDOT 07-50 – Bridge Replacement Program

Purpose — Define the function of the Bridge Replacement Program, and the relationship between UDOT and the Local Governments.

Applicability — All Highway Bridges in Utah.

General Procedures — UDOT will participate in the program as authorized by the Federal legislation. The program will be administered in accordance with Federal laws and provisions of the United States Department of Transportation.

Coordination — UDOT Bridge Division, Transportation Commission, FHWA.

UDOT 07-95 – Design Engineering on Local Government Projects

Purpose — Define how design engineering may proceed on Local Government Federal Aid Projects.

Applicability — All Local Government Federal Aid Projects.

General Procedures — When Federal funds are used for design engineering, local governments may use their engineer of record or a consultant, on local Federal-aid Projects, provided they are certified to perform design engineering.

Coordination — UDOT staff members, Local Governments.

UDOT 08-1 – Design Process

Purpose — To establish guidelines for the design of Utah Department of Transportation projects.

Applicability — All UDOT improvement projects.

General Procedures — All persons that design Utah Department of Transportation projects must use the Preconstruction Process Manual for guideline.

Coordination —

UDOT 08-2 – Acceptable Standards For Project Design

Purpose — To designate those standards that are acceptable for project design.

Applicability — All UDOT projects.

General Procedures — All UDOT projects shall be designed to meet existing and future traffic needs, with emphasis on safety, durability and economy of maintenance. Follow all applicable UDOT policies and procedures, standard and supplemental specifications, standard drawings, manuals of instructions, and guidelines. In addition all AASHTO design standards as listed in the policy.

Coordination — UDOT Project Development Division.

UDOT 08A-1 – Highway Geometric Standards

Purpose — Use approved highway geometric standards as guidelines for the development and maintenance of State Highway Plan, and in the evaluation of existing highway and bridges deficiencies.

Applicability — All planned projects

General Procedures — Optimum highway standards are established and maintained for all classes of State highways, consistent with available funding and traffic requirements estimated for a normal future period of twenty years.

Coordination — Project Development Division

UDOT 08A-6 – Storm Sewer

Purpose — Provide guidance for the design of new highways and the construction of storm sewers

Applicability — All UDOT and Local Government highway improvement projects.

General Procedures — The Department will provide storm sewers for water generated on the state road in a developed area in conjunction with new highway construction under conditions outlined in the policy.

Coordination — UDOT Regions.

UDOT 08A1-1 – Minimum Design Loads, Structures

Purpose — Define minimum design loads for new state and local government bridges.

Applicability — All state and local government bridges.

General Procedures — All state and local government bridges will be designed in accordance with the most current edition of AASHTO Standard Specifications for Highway Bridges with a minimum of MS-19 (HS-20). All bridges in the state highways system will be designed for seismic loading according to the policy.

Coordination — UDOT Bridges Division.

UDOT 08A2-4 – Environmental Policy

Purpose — To support a department wide environmental ethic that establishes a responsibility for sound environmental planning, design, construction and maintenance activities.

Applicability — all UDOT project and highway system work.

General Procedures — Follow the guidelines in the policy

Coordination — UDOT Environmental Division.

II. Roadway Drainage (include acceptable analysis and design methods, computer programs)

A. General

All drainage design shall conform to the methods and criteria outlined in this chapter and in this manual. Table 3-1 shows the design frequencies to be used in designing drainage facilities. When designing, consider the impact of less frequent storms generating greater runoff than design with respect to possible damage to the structure, danger to life and property and the length and frequency of resulting traffic delay. For example the impact of a 100-year storm on a facility designed to accommodate a 50-year storm should be investigated for its effects on the highway facility and adjoining properties. Temporary facilities in urban areas should conform to Table 3-1. Temporary facilities in rural areas should be designed to accommodate a 5-year storm event.

Table 3-1

TYPE OF STRUCTURE	INTERSTATE PROJECTS*	PROJECTS OTHER THAN INTERSTATE* (Over 1000 AADT**)	LOW VOLUME PROJECTS (Under 1000 AADT**)
Bridges	50 years	50 years	25 years
Culverts	50 years	50 years	25 years
Storm Sewers	10 years	10 years	10 years
Storm Sewers for draining depressed sections	50 years	25 years	10 years
Roadway Gutters	10 years	10 years	5 years

**In cases where a local community has adopted the regular program of the Federal Emergency Management Agency (FEMA) and FEMA has initiated or completed the flood plain study, the 100-year design frequency shall be used.*

***Based on a twenty year traffic projection.*

B. Hydrologic Methods

The following are hydrologic methods for estimating run-off for the design of drainage structures on the Utah Highway System:

- Log Pearson III Flood Frequency (where at least 25 years of stream gage data is available)
- UDOT Regression Equations
- USGS Regression Equations
- NRSC Synthetic Hydrograph, TR-55
- Rational Method

All drainage basin's characteristic must be calculated using Watershed Modeling System (WMS) computer program.

C. Ditches and Open Channels

All ditches and open channel shall be designed according to the procedures outlined in chapter 8 of this manual.

D. Storm Drains

Culverts must be properly designed to efficiently and economically convey a design discharge under a roadway. Because culverts of differing manufacture have different Manning's "*n*" values, the Department uses a baseline *n* value of 0.012 in preparing its plans. Whenever materials having different *n* values are allowed, select sizes for each

material that are hydraulically equivalent. In lieu of detailed calculations for an individual culvert crossing, Table 9-1 may be used to assure the equivalency of culvert types.

E. Detention and Retention

Detention and retention facilities shall be designed according to the procedures outlined in chapter 12 of this manual.

F. Erosion and Sediment Control

Please see chapter 16 of this manual for design of erosion protection and sediment control.

G. Stormwater Pumping

Chapter 14 of this manual includes design guideline for storm-water pumps.

H. Small Structure Design

All small structure shall be designed according to the UDOT Structures Manual of Instruction.

III. Design Policy For Sizing Bridge Waterway Openings

A. Design Requirements

B. Policies

C. Documentation of Hydraulic Design

D. Design Methods

E. Hydraulic Analysis of Natural Channel and Floodplains

F. Hydraulic Analysis of Existing Structure(s)

G. Hydraulic Analysis of the Proposed Structure(s)

H. Additional Information Need For Review